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Vol. VI., No. 52.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, Apr., 1879.

§ 305. NOTES ON HEPATICOLOGY by C. F. AUSTIN.

Frullania Donnellii, *n. sp.*—Autoica, rufescens, fere minima generis, caule cum filis longissimis nigris cornicularioidis (forsitan ad *Fungos* pertinentibus) intertexto confertim simpliciter pinnatim vel subfasciculatim ramoso, ramulis brevissimis subsemierectis obtusissimis, foliis ovato-rotundis covexiusculis obtusis integerrimis contiguis vel imbricatis, auricula majuscula oblongo-clavata vel subcylindrica a caule distante et cum eo subparalleli vel deflexa (haud divergente), lobulo interjecto subulato minutissimo, amphigastriis caule duplo latioribus subobovatis bifidis, lobis obtusiusculis, perianthio obcuneato-oblongo, dorso planiusculo, ventre versus apicem compressum truncatum apiculatum brcvissime unicarinato, foliis amphigastriisque involucralibus magnis profunde inciso-serratis: androecium minutum globosum brevipedunculatum.

East Florida, Mar. 1877. Capt. *J. Donnell Smith.*

A very small species, readily distinguished by the characters above denoted. Auricle longer and more distant from the stem, amphigastria wider, involucre larger and incised-serrate, perianth less expanded at the apex and somewhat different in texture, male spike globose and somewhat hidden under the leaves, otherwise much like *F. Knuzei*, var. (*F. Drummondi*, Tayl.).—*F. fragilifolia*, TAYL., (*F. polysticta*, MONT , *F. Sullivantiæ*, AUST.) is also of about the same size, but the ramificationis more vague, leaves narrower and marked by a medial line or patch of bead-like cells, auricle shorter and close to the stem, involucral leaves much less deeply serrate, perianth composed of much smaller cells, &c.—*F. gymnotis*, NEES. (*F. macularis*, TAYL., *F. Leaana*, AUST., a tropical species, erroneously attributed to this country by me, through a specimen in Herb TAYL., from Para, Brazil, but labelled "Cincinnati, Ohio,") has the leaves apiculate and composed of more oval cells, those at the base conspicuously enlarged, auricle twice as distant from the stem, branch leaves smaller and more closely imbricated, &c.

Frullania (*Jubula*) **piligera.**—*F. Hutchinsiæ* var. *β*, Synop. Hepat. p. 426.—*F. Hutchinsiæ* proxima; differt tamen foliis minus rotundis apice magis minusve piligeris (pilis 1–3–6 longis) reti magis ovali, auricula magis clavata, amphigastriis angustioribus, etc.

Sandwich Islands, *Baldwin* (*Eaton*). Java. (*Synop. Hepat.*)

Radula Caloosiensis, *n. sp.*—Dioica, flavicans; caule brevi rigidulo arcte repente parce ramoso vix subpinnato, foliis convexis (tumidulis) integerrimis vel obscure crenulatis obtusis, margine plerumque gemmiparo, lobulo inferiore majusculo subacuminulato vel obtuso sæpe subundulato margine interiore cauli adnato et supra eum subprotracto, reti fere ut in *R. complanata* mediocri, cellulis subæqualibus hexagono-rotundis supra convexis farctis valde opacis intercalaribus angustioribus hyalinis, perianthio breviusculo e basi obconica late oblongo-quadrato valde compresso, dorso lenissime convexo, ore bilabiato, labiis fere integris subdecurvis; spicula masc. longiuscula laxiuscula subinterrupta.

Caloosa, Florida, March, 1878.

Allied to *R. quadrata*, GOTT., and *R. Xalapensis*, MONT.; but the lower lobe of the leaf is smaller and much less undulate or not at all so. Very near *R. affinis*, GOTT.; but the perianth is broader and shorter from a longer obconic base, and not subcontracted below the more entire apex; cells of the leaves not unequal, &c. About the size of the usual forms of *R. complanata*, DUM., and in general apearance resembles it very much, but is of a fine yellow color, perianth more obconic at the base, inflorescence different, &c.; cells of the leaves and gemmæ on their margin much the same. In some of its forms it is difficult to distinguish from *R. australis*. AUST., which grows throughout Northern Florida, but was not found in the Caloosa Country. But this species is usually of an olive green color verging on to yellow or fuscous; the male spike is longer and more compact; the perianth is longer and narrower; both lobes of the leaf are a little smaller, the lower one is less adnate to the stem, and never undulate, the cells are somewhat smaller, not convex above, usually with a minute pellucid point in the centre, and the interstices are broader and less hyaline.

Gottschea Jamesii, *n. sp.*—Magnitudo plantarum submediocris. Folia imbricata, lamellata, ciliata, subcomplicata, mediocriter (pro genere) laxa apice inæqualiter emarginato-biloba, lobo superiore brevissimo obtuso, apice plano haud lamellato subrecurvo. Amphigastria palmatim (circa 5-) lobata, lobis canaliculatis ciliatis. Lamellæ foliorum interruptæ, ciliatæ, aliæ longiusculæ, aliæ brevissimæ et sæpe (præcipue illæ supra medium lobi superioris) ad cilias singulas reductæ.

Chili. Amiciss. T. P. JAMES, dedit.

Herberta sanguinea.—*Sendtnera juniperina, var. δ, sanguinea*, G. L. N. Syn. Hep. p. 139. Differt ab *H. juniperina*, (Sw.); foliis vix vittatis basi minus ciliatis, reti majore, intercalaribus multum latioribus opacis, colore sæpe sanguinea, etc.

Sandwich Islands, *Mann & Brigham*, No. 63. *Baldwin*, Nos. 15 and 98.

Mastigophora Californica.—*Lepidozia? Californica*, AUST., in this Journal, Vol. 6, p. 19. (Mar., 1875). Prof. Macoun collected this on rotten wood on Vancouvers Island, in 1875. His specimens are of a red color, and remind one of *Blepharozia ciliaris*.

Cephalozia nematodes, GOTT.—in Hepat. Cuben. Wright., under *Jungermania*. This species is not uncommon on the banks of ditches, margins of swamps, etc., in Florida and Southern Georgia. It has much the appearance of *Blepharostoma trichophyllum* (L.) DUM.; but the texture of the whole plant is much more lax, the leaves are longer and more distant, the amphygastria are smaller and biparted (2–3 parted?) with their apices incurved, and the fruit is situated on a short ventral branch.—*C. confervifolia* GOTT. l. c., has a more solid stem, smaller biparted confervoid leaves and no amphigastria; besides it grows on rotten wood, and has not yet turned up in our country.—[*Zoopsis argentea*, H., & T. = *Cephalozia argentea*, LINDB.]

Odontoschisma subjulacea.—*Jungermania caudifera*, TAYL. Mss, ex parte. Plantae dense caespitosae saturate virides nigro-purpureo variegatae; caule arcuato-erecto subjulaceo apice nonnunquam parce gemmigero (vix caudifero !), foliis rotundo-ovalibus arcte imbricatis semierectis, incurvis valde concavis vix marginatis, reti *S. denudatae*, amphigastriis (quæ semper adsunt) minutis ovato-triangularibus plerumque purpureis; radiculis nullis: fructu—?

Australia, *Drummond.* Sandwich Islands, *Baldwin* (*Eaton.*)

Resembles *O. denudata* (NEES) (*O. Hubeneriana* RABENHORST), with which Taylor confounded it, in size and in the reticulation of the leaves; but differs in its suberect subjulaceous scarcely caudiferous stems, more concave subinvolute leaves and in the uniform presence of amphigastria.

O. prostrata (NEES) (*O. longiflora*, Tayl.) occurs in the Southern States (rare). The specimens given under this name in Wright's Cuban Hepaticæ mostly belong to *O. Sphagni*, (DICKS).

Jungermania Mauii, *n. sp.*—Saturate viridis; caule erecto (semper ?) 6–8 lineas longo, foliis orbiculatis imbricatis lineam et ultra latis immarginatis flaccidis subdecurrentibus subpatentibus grosse subrotundo-areolatis (intercalaribus crassis) apicalibus appressis in gemmulam confertis, perianthio (immaturo) incluso subplicato ore denticulato, radicibus purpureis; florescentia dioica ?

Maui, Sandwich Islands, 1876, *Baldwin* (*Eaton*).

Allied to *J. Abyssinica*, *J. hyalina*, &c. Somewhat like *J. cordifolia*, HOOK., in general appearance but of a different (not fuscous) color; leaves more imbricated, more rotund, more lax, etc.

Steetzia subciliata, *n. sp.*—Dioica; fronde stipitata erectiuscula bi—trifida, laciniis oblongo-linearibus (6-8 lineas longis, 1-2 lineas latis) subundulatis in medio fusco-vittatis margine remote ciliata, ciliis erectis, apice obtuso siccitate constricto, costa tereti tenui sub apice desinente, involucro subbasilari inciso-ciliato (immaturo).

Japan, U. S. North Pac. Expl. Expd., under Com. Rodgers.

Differs from *S. Lyellii* in the stipitate, subciliate, thinner, less undulate frond, subbasilar fruit, etc.

Steetzia Baldwini, *n. sp.*—Dioica; fronde sessili vel substipitata divaricatim furcata integrave lineari vel obovato-oblonga valde undulata pallida margine integerrima per medium spatio lato obscura, nervo angustissimo tereti sub apice finiente, invclucro inciso brevi, perianthio bilineari oblongo-cylindrico latiusculo pallido ore lacerato-ciliato, calyptra æquilonga nuda, capsula oblongo-cylindracea apice obtuse acutata trivalva (semper ?) valvulis strictis; pl. masc. haud visa.

Sandwich Islands, 1876, *Baldwin (Eaton.)*

In the color and in the undulation of the frond like *S. cladorrhizans*, TAYL.; but that is smaller with a closer reticulation.—Perianth shorter than in *S. Lyellii;* arising from about the middle of the frond. Frond pale green, flattish, rather broad, an inch or more in length, broadly stipitate, rarely somewhat lobed on the margin, the whole of the middle part of it obscure. Elaters very long and slender.

Rhopalanthus, (*n. gen.* LINDB., Manip. Musc. Secundus, 1874, p. 390,) was wrongly printed " *Rhossalanthus* " on p. 21, Vol. VI, of this Journal. It is very closely related to *Scalia* (*Jungermania*) *Hookeri*, *Lyell.*

Anthoceros Donnellii, *n. sp.*—Dioicus; fronde plana subtenui lævi indistinctissime late nervosa profunde laciniata subcrenata subtus copiosisssime tuberosa, involucro magno infundibuliformi, ore inciso, capsula sporis et elateribus fere ut in *A*, *lævi.*

Banks of the Caloosahatchee River, Southwest Florida, Mar. 1878; rare.

Capsule and spores yellow; the latter smooth, or nearly so. Fruit very rare. Has much the appearance of *A. lævis;* but the divisions of the frond are narrower and more linear, and the involucre is much expanded above, characters which readily distinguish it. The frond is somewhat channelled when dry, and often becomes somewhat fulvous in the herbarium. The tubers are always present, usually numerous, and are attached to the frond by a longish umbilicus. They are minute, nearly round, furnished with a few short radicles, at first white, but becoming brown. They are not to be confounded with the descending tuber-like apex of the midnerve, which gives the specific name to *A. tuberosus*, TAYL.—a character which is not uncommon among the frondose Hepaticæ, and which sometimes occurs among the foliaceous ones.

Anthoceros Mohrii, *n. sp.*—Fronde crassa opaca elevato-lamellosa lacunosa margine elevato-crispata subtus dense radiculosa enervosa intus tuberifera, involucro brevi incrassato, ore truncato indistincte pluricrenato sæpe scarioso, capsula unciali crassa rigida luteo-brunnea vel subnigra varie curvata et torta longiuscule pedicellata, sporis ochraceis crebre minutissime papillosis opacis vel paulo pellucidis, elateribus valde difformibus aliis longusculis aliis brevissimis.

Port Royal, S. Car., Apr., 1878, growing with *A. lævis*, var. *major*, *A. punctatus*, var. *scariosus*, and *A. Ravenelii.* It has also been sent to me during the past year from Mobile, Ala., by *Dr. C. Mohr.*

Readily distinguished from the first of the above named species by its thicker subcristate frond, much shorter involucre not slightly expanded at the mouth when dry, shorter darker colored tortuous capsule, which ripens about one month later, smaller more papillose and opaque spores, and even more variable darker and broader elaters, &c. (Both the other species have black spores).

Both *A. lævis*, L, and *A. punctatus*, L, are common in the South —the former especially so,—where they mature in March, and usually grow more luxuriantly than at the North (where they mature in Sept. and Oct.), and they frequently have the mouth of the involucre scarious, a phenomenon seldom witnessed at the North, and which appears to be produced by frosts while this organ is in a young stage of growth. *A. lævis*, var. *major*, AUST. (*A. Carolinianus*, MX; *A. laciniatus*, SCHWEINITZ), is especially abundant on the Caloosa River. This and A. Donnellii were the only species found there. *A. punctatus*, var. *Eatoni*, AUST., was found on the

St. John's and Indian Rivers by Capt. Donnell Smith. It was also found in Cuba by Dr. Chas. Wright, and confounded with *A. lævis* in his Hepat. Cubenses. It is characterized by a subpellucid more or less nerved, subflabelliform often substipitate frond, with some of the perianths horizontal and more or less adnate with its upper surface. *A. Ravenelii*, AUST., was found from Middle Florida, to South Carolina. This species was originally described from rather immature specimens. *A. Lescurii*, and *A. Joorii*, AUST., are more mature states of the same species. It is readily distinguished by its thick black fronds, very thick capsules and large spores. The green capsule is over a half line in thickness, but shrinks greatly in drying, and does not regain its usual size in soaking.

Sphærocarpus Californicus, *n. sp.*—Dioica; plantæ humillimæ, cæspitosæ, suberectæ; fronde substipitata profunde lobata, lobis sæpe folioformibus, involucro oblongo vel subcylindrico breviter obtuse acuminulato, sporis *S. Michelii.* (*S. Berterii*, AUST., Exsic. n. 138, non BISCH.)—California.

Male and female plants usually (always ?) growing together. Much like *S. Michelii*, BERNH.; but the frond is somewhat stipitate, and the involucre is more cylindrical and subacuminulate.

Thallocarpus, LINDB.; Cryptocarpus, AUST. Capt. Donnell Smith has collected a fine lot of this plant, (*T. Curtisii*) in Florida. It is diœcious. The male frond is furnished with "ostioles" precisely like some *Riccias*. Mode of growth also as in *Riccia*, in which genus it should probably be included as a subgenus. The adhering together in fours of the spores until long after maturity, as in *Sphærocarpus*, appears to be the only character in which it is decidedly different from *Riccia*.—I have examined many specimens of various species of *Riccia*, both in the growing and in the preserved state, searching long and carefully for the antheridia, without ever seeing them except in *R. Watsoni*, AUST., where they are both numerous and large, and are imbedded in the frond. I have seen the so-called *ostioles* only in *R. lata*, TAYL., *R. Donnelii*, AUST., and *R.* (*Thallocarpus*) *Curtisii*. In all these they are easily seen without the aid of a lens.—In *Sphœcocarpus* the antheridia are large and numerous, sessile, and enclosed (singly) in conical purplish involucres.—*Riccia reticulata*, SWARTZ., is certainly only the prothallus of some Fern.—*Vittaria?* Dr. Chas. Wright collected it on the trunks of Palms in Cuba, and some of his specimens are accompanied by young fronds of the Fern proper,—some of them an inch or two long. *Vittaria linearis*, in Florida, has a similar but much smaller prothallus, which somewhat resembles the young nerveless fronds of a *Metzgeria*. It is frequently met with on the trunks of the Palmetto, and is often accompanied by the young fronds of the Fern proper: in fact it appears to be always present among the rootlets of the mature fronds. A nearly similar prothallus, but rather suggestive of an *Aneura*, grows on the ground both in Florida and in Cuba, from which spring the fronds of some *Hymenophyllum*. Dr. Lindberg, in Hepat, Hibern. (Act. Soc. Fenn. X, p. 472), records some valuable observations on these things, and quite conclusively shows that they are diœcious prothalli of Ferns ("An ad *Hymenophylleas* pertinet?"), and considers them perennial. However, he winds up his remarks by saying that he leaves the whole matter in the greatest doubt (!) The form which Swartz referred to *Riccia* was referred to the *Lichenes* by Acharias, and to the *Algæ* by Aghardh.—There can be but little doubt that the plant described in this Journal (vol. VI, p. 188) by Mr. Wolle, as an *Alga*, under the name of *Poterophora Donnellii*, nov. gen. et sp., is also the prothallus of some dioecious fern or filicoid. In structure it too is much like a *Liverwort*; e. g. *Jung. confervifolia*. GOTT. [Almost from the beginning of my acquaintance with the Liverworts, I have been possessed with the fancy that the Ferns are but a higher development of them; also that they (the Liverworts) are but a higher development of the simpler *Algæ*.]

§ 306. New or Little-known Ferns of the United States. No. 6.

16. **Adiantum tenerum,** Swartz.—Distinguished from *Ad. Capillus-Veneris* by the broadly deltoid-ovate outline of the commonly much larger 3—4-pinnate fronds, and especially by having the ultimate pinnules articulated to their petioles, so that after maturity they all fall off, leaving the rachis and all its branches and branchlets bare of foliage. The ultimate pinnules vary from rhomboid to roundish-cuneate; they are usually less lobed than in the Venus-hair, and have rather short oblong or somewhat lunate involucres. The credit of the discovery is in great part due to Mrs. Dr. Barnes, of Syracuse, who found in a conservatory living plants which were brought from Florida by Mr. Christian Beh, who discovered them in March, 1877, growing about the opening of a "sink-hole" on the plantation of a Mr. Williams near Ocala. Mrs. Barnes, on seeing the plants, suspected something different from *A. Capillus-Veneris*, and sent me at first an imperfect frond, which I doubtfully referred to *Ad. tenerum*. In a few days she obtained much finer specimens, which she sent me, and herself pointed out the important distinguishing character of the articulation at the base of the pinnæ. It now appears that the same species was noticed on the Halifax river a long time ago by Mr. S. N. Chamberlin, who showed the plants to Miss Mary C. Reynolds in May, 1877. Miss Reynolds collected specimens at that time, and reported the fern as *Ad. Capillus-Veneris* in the BULLETIN of Sept. 1877, (p. 176), where she so well describes the habit of *A. tenerum* that I ought to have recognized the species from what she says about it. I received some of her specimens very lately from Mr. C. E. Faxon. Mr. Davenport has specimens from Ocala, gathered in 1878 by Mr. Shockley; and to-day I have before me a very fine and full set of specimens collected the present month at Ocala by Capt. J. Donnell Smith, who, with his characteristic generosity, has sent me his whole collection of Ocala Ferns to choose from for my herbarium.

Capt. Smith has sent with the *Adiantum*, fine series of specimens of *Asplenium myriophyllum* and *A. firmum*, *Pteris Cretica*, and a *Polypodium* which seems to be so nearly intermediate between *P. pectinatum* and *P. Plumula*, that I cannot at once decide what to do